100	90's	80's	70's	60's	<60
2	1	7	5	4	4

Assessment 1
Dusty Wilson
Math 254

Name: Key

Suppose a contradiction were to be found in the axioms of set theory. Do you seriously believe that a bridge would fall down?

Frank Ramsey
1903 – 1930 (English mathematician)

No work = no credit

NO CAS calculators

Warm-ups (1 pt each): $-4^2 =$ -16 $-\frac{0}{4} =$ 0 $\frac{\partial}{\partial x}\left(2x^3y^4\right) =$ $6x^2y^4$

1.) (1 pt) In addition to infinity, one of the topics in the philosophy of math is called "axiomatic set theory." According to Ramsey (above), how seriously ought we be concerned by the possibility of a contradiction arising in set theory? Answer using complete English sentences.

We should not worry as it won't impact every day activities (like crossing bridges).

2.) (1 pt) Slack posting: # Happy Felix Day

3.) (4 pts) Carefully sketch a contour map of $f(x,y) = x^2 + 4y^2$ with four labeled contour lines.

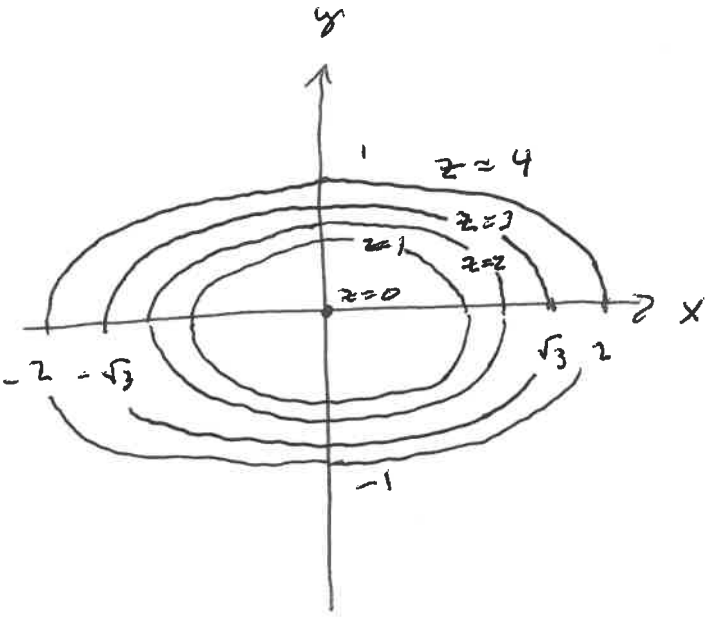
$z = 0$: $0 = x^2 + 4y^2$

$z = 1$: $1 = x^2 + 4y^2$

$z = 2$: $2 = x^2 + 4y^2$

$z = 3$: $3 = x^2 + 4y^2$

$z = 4$: $4 = x^2 + 4y^2$



4.) (4 pts) If $f(x,y)=6x+7y+3xy^2-2e^{x^4y^5}$, find $f_x(x,y)$.

$$f_x(x,y) = 6 + 3y^2 - 8x^3y^5e^{x^4y^5}$$

5.) (4 pts) Find $\frac{\partial^2 z}{\partial y \partial x}$ of the equation $z=3\cos(x^2\cdot y)$. Simplification is optional.

$$\frac{\partial z}{\partial x} = -3\sin(x^2y)\cdot 2xy$$

$$= -6xy\sin(x^2y)$$

$$\Rightarrow \quad \frac{\partial^2 z}{\partial y \partial x} = -6x\sin(x^2y) + -6xy\cos(x^2y)\cdot x^2$$

$$= -6x\sin(x^2y) - 6x^3y\cos(x^2y)$$